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TRANSACTIONS
OF THE
AMERICAN
FISHERIES
SOCIETY



SEPTEMBER, 1917

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The American Fisheries Society

Organized 1870—Incorporated 1910

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TRANSACTIONS
of the
American Fisheries Society

"To promote the cause of fish culture; to gather and diffuse information bearing upon its practical success, and upon all matters relating to the fisheries; to unite and encourage all interests of fish culture and the fisheries; and to treat all questions of a scientific and economic character regarding fish."

VOLUME XLVI, NUMBER 4
1916-1917

Edited by Raymond C. Osburn

SEPTEMBER, 1917

Published Quarterly by the Society
NEW YORK, N. Y.

CERTIFICATE OF INCORPORATION OF THE AMERICAN FISHERIES SOCIETY

We, the undersigned, persons of full age and citizenship of the United States, and a majority being citizens of the District of Columbia, pursuant to and in conformity with sections 599 to 603, inclusive, of the Code of Law for the District of Columbia, enacted March 3, 1901, as amended by the Acts approved January 31 and June 30, 1902, hereby associate ourselves together as a society or body corporate and certify in writing:

1. That the name of the Society is the AMERICAN FISHERIES SOCIETY.
2. That the term for which it is organized is nine hundred and ninety-nine years.
3. That its particular business and objects are to promote the cause of fish culture; to gather and diffuse information bearing upon its practical success, and upon all matters relating to the fisheries; to unite and encourage all interests of fish culture and the fisheries; and to treat all questions of a scientific and economic character regarding fish with power:
 - a. To acquire, hold and convey real estate and other property, and to establish general and special funds.
 - b. To hold meetings.
 - c. To publish and distribute documents.
 - d. To conduct lectures.
 - e. To conduct, endow, or assist investigation in any department of fishery and fish-culture science.
 - f. To acquire and maintain a library.
 - g. And, in general, to transact any business pertinent to a learned society.
4. That the affairs, funds and property of the corporation shall be in general charge of a council, consisting of the officers and the executive committee, the number of whose members for the first year shall be seventeen, all of whom shall be chosen from among the members of the Society.

Witness our hands and seals this 16th day of December, 1910.

SEYMOUR BOWER	(Seal)
THEODORE GILL	(Seal)
WILLIAM E. MEEHAN	(Seal)
THEODORE S. PALMER	(Seal)
BERTRAND H. ROBERTS	(Seal)
HUGH M. SMITH	(Seal)
RICHARD SYLVESTER	(Seal)

Recorded April 16, 1911.

AMERICAN FISHERIES SOCIETY

Organized 1870

The first meeting of the Society occurred December 20, 1870. The organization then effected continued until February, 1872, when the second meeting was held. Since that time there has been a meeting each year, as shown below. The respective presidents were elected at the meeting, at the place, and for the period shown opposite their names, but they presided at the subsequent meeting.

PRESIDENTS, TERMS OF SERVICE, AND PLACES OF MEETING.

1. William Clift.....	1870-1872.....	New York, N. Y.
2. William Clift.....	1872-1873.....	Albany, N. Y.
3. William Clift.....	1873-1874.....	New York, N. Y.
4. Robert B. Roosevelt.....	1874-1875.....	New York, N. Y.
5. Robert B. Roosevelt.....	1875-1876.....	New York, N. Y.
6. Robert B. Roosevelt.....	1876-1877*.....	New York, N. Y.
7. Robert B. Roosevelt.....	1877-1878.....	New York, N. Y.
8. Robert B. Roosevelt.....	1878-1879.....	New York, N. Y.
9. Robert B. Roosevelt.....	1879-1880.....	New York, N. Y.
10. Robert B. Roosevelt.....	1880-1881.....	New York, N. Y.
11. Robert B. Roosevelt.....	1881-1882.....	New York, N. Y.
12. George Shepard Page.....	1882-1883.....	New York, N. Y.
13. James Benkard.....	1883-1884.....	New York, N. Y.
14. Theodore Lyman.....	1884-1885.....	Washington, D. C.
15. Marshall McDonald.....	1885-1886.....	Washington, D. C.
16. W. M. Hudson.....	1886-1887.....	Chicago, Ill.
17. William L. May.....	1887-1888.....	Washington, D. C.
18. John H. Bissell.....	1888-1889.....	Detroit, Mich.
19. Eugene G. Blackford.....	1889-1890.....	Philadelphia, Pa.
20. Eugene G. Blackford.....	1890-1891.....	Put-in Bay, Ohio
21. James A. Henshall.....	1891-1892.....	Washington, D. C.
22. Herschel Whitaker.....	1892-1893.....	New York, N. Y.
23. Henry C. Ford.....	1893-1894.....	Chicago, Ill.
24. William L. May.....	1894-1895.....	Philadelphia, Pa.
25. L. D. Huntington.....	1895-1896.....	New York, N. Y.
26. Herschel Whitaker.....	1896-1897.....	New York, N. Y.
27. William L. May.....	1897-1898.....	Detroit, Mich.
28. George F. Peabody.....	1898-1899.....	Omaha, Neb.
29. John W. Titcomb.....	1899-1900.....	Niagara Falls, N. Y.
30. F. B. Dickerson.....	1900-1901.....	Woods Hole, Mass.
31. E. E. Bryant.....	1901-1902.....	Milwaukee, Wis.
32. George M. Bowers.....	1902-1903.....	Put-in Bay, Ohio
33. Frank N. Clark.....	1903-1904.....	Woods Hole, Mass.
34. Henry T. Root.....	1904-1905.....	Atlantic City, N. J.
35. C. D. Joslyn.....	1905-1906.....	White Sulphur Spgs., W. Va.
36. E. A. Birge.....	1906-1907.....	Grand Rapids, Mich.
37. Hugh M. Smith.....	1907-1908.....	Erie, Pa.
38. Tarleton H. Bean.....	1908-1909.....	Washington, D. C.
39. Seymour Bower.....	1909-1910.....	Toledo, Ohio
40. William E. Meehan.....	1910-1911.....	New York, N. Y.
41. S. F. Fullerton.....	1911-1912.....	St. Louis, Mo.
42. Charles H. Townsend.....	1912-1913.....	Denver, Colo.
43. Henry B. Ward.....	1913-1914.....	Boston, Mass.
44. Daniel B. Fearing.....	1914-1915.....	Washington, D. C.
45. Jacob Reighard.....	1915-1916.....	San Francisco, Cal.
46. Geo. W. Field.....	1916-1917.....	New Orleans, La.

*A special meeting was held at the Centennial Grounds, Philadelphia, Pa., October 6 and 7, 1876.

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The American Fisheries Society

LIST OF MEMBERS, 1916-1917

Showing Year of Election to Membership

Honorary Members

The President of the United States, WOODROW WILSON.

The Governors of the several states:

Alabama, CHARLES HENDERSON.

Arizona, GEORGE W. P. HUNT.

Arkansas, CHAS. H. BROUGH.

California, HIRAM W. JOHNSON.

Colorado, JULIUS C. GUNTER.

Connecticut, MARCUS A. HOLCOMB.

Delaware, JOHN G. TOWNSEND, JR.

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Georgia, HUGH M. DORSEY.

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Illinois, FRANK O. LOWDEN.

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Kansas, ARTHUR CAPPER.

Kentucky, A. O. STANLEY.

Louisiana, R. G. PLEASANT.

Maine, CARL MILLIKEN.

Maryland, EMERSON C. HARRINGTON.

Massachusetts, SAMUEL W. McCALL.

Michigan, ALBERT E. SLEEPER.

Minnesota, J. A. A. BURNQUIST.

Mississippi, THEODORE G. BILBO.

Missouri, FREDERICK D. GARDNER.

Montana, SAMUEL V. STEWART.

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Nevada, EMMET D. BOYLE.

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New Jersey, WALTER E. EDGE.

New Mexico, E. C. DA BACA.

New York, CHAS. S. WHITMAN.

North Carolina, THOMAS W. BICKETT.

North Dakota, LYNN J. FRAZIER.

Ohio, JAMES M. COX.

Oklahoma, R. L. WILLIAMS.

Oregon, JAMES WITHYCOMBE.

Pennsylvania, M. G. BRUMBAUGH.

Rhode Island, R. LIVINGSTON BEECKMAN.

South Carolina, RICHARD I. MANNING.

South Dakota, PETER NORBECK.

Tennessee, THOMAS C. RYE.

Texas, JAMES E. FERGUSON.

Utah, SIMON BAMBERGER.

Vermont, HORACE F. GRAHAM.

Virginia, H. C. STUART.

Washington, ERNEST LISTER.

West Virginia, JOHN J. CORNWELL.

Wisconsin, E. L. PHILIPP.

Wyoming, JOHN B. KENDRICK.

- '08 ANTIPA, PROF. DR. GREGOIRE, Inspector-General of Fisheries, Bucharest, Roumania.
- '06 BESANA, GIUSEPPE, Lombardy Fisheries Society, Via Rugabello 19, Milan, Italy.
- '09 BLUE RIDGE ROD AND GUN CLUB, Harper's Ferry, W. Va.
- '93 BORODIN, NICOLAS, Petrograd, Russia.
- '12 CALDERWOOD, W. L., Inspector of Salmon Fisheries for Scotland, Edinburgh, Scotland.
- '04 DENBIGH, LORD, London, England.
- '89 FISH PROTECTIVE ASSOCIATION OF EASTERN PENNSYLVANIA, 1020 Arch St., Philadelphia, Pa.
- '04 FRYER, SIR CHARLES E., Former Supervising Inspector of Fisheries, Board of Agriculture and Fisheries, London, England.
- '06 GRIMM, DR. OSCAR, Petrograd, Russia.
- '04 HOFER, PROF. DR. BRUNO, Biological Research Station for Fisheries, Munich, Germany.
- '04 KISHINOURYE, DR. K., Imperial University, Tokyo, Japan.
- '08 KITAHARA, DR. TASAKU, Imperial Fisheries Bureau, Tokyo, Japan.
- '88 LAKE ST. CLAIR SHOOTING AND FISHING CLUB, Detroit, Mich.
- '04 MATSUBARA, PROF. S., Imperial Household Department, Tokyo, Japan.
- '09 NAGEL, HON. CHAS., St. Louis, Mo.
- '95 NEW YORK ASSOCIATION FOR THE PROTECTION OF FISH AND GAME, New York City.
- '08 NORDQVIST, DR. OSCAR FRITJOF, Superintendent of Fisheries, Lund, Sweden.
- '06 PERRIER, PROF. EDMOND, Director Museum of Natural History, Paris, France.
- '92 STEINBACHNER, PROF. DR. FRANZ, Royal Natural History Museum, Vienna, Austria.
- '92 VINCIGUERRA, PROF. DR. DECIO, Director Royal Fish Cultural Station, Rome, Italy.
- '08 VON KADICH, DR. HENRICH, Department of Forestry and Domain, Vienna, Austria.
- '06 VON PIRKO, FRANZ, Austrian Fishery Society, Vienna, Austria.

Corresponding Members

- '84 APOSTOLIDES, PROF. NICOLY CHR., Athens, Greece.
- '87 ARMISTEAD, J. J., Dumfries, Scotland.
- '04 AYSON, L. F., Commissioner of Fisheries, Wellington, New Zealand.
- '09 FLEGEL, CHAS., Canea, Crete.
- '08 HIGGINSON, EDUARDO, Consul for Peru, New York City.
- '97 JAFFE, S., Sandfort, Lustringen, Germany.
- '84 LANDMARK, A., Inspector of Norwegian Fresh-Water Fisheries, Christiania, Norway.
- '84 MARSTON, R. B., Editor of the Fishing Gazette, London, England.
- '09 MOHSIN, S. M., Bengal Fisheries Department, Calcutta, India.
- '89 OLSEN, DR. O. T., Grimsby, England.
- '08 POTTEAU, CHARNLEY, Lommel, Belgium.
- '84 RAVERET-WATTEL, C., Director of Aquicultural Station at Nid-de-Verdier, 20 Rue des Acacias, Paris.
- '09 RIEDEL, C., Bergstedt, Germany.
- '84 SARS, PROF. G. O., Christiania, Norway.
- '84 SOLSKY, BARON N. DE, Director of the Imperial Agricultural Museum, Petrograd, Russia.
- '10 STEAD, DAVID G., Fisheries Department, Sydney, New South Wales, Australia.

Patrons

- '14 ALASKA PACKERS' ASSOCIATION, San Francisco, Calif.
- '15 ALLEN, HENRY F. (Agent, Crown Mills), 210 California St., San Francisco, Cal.
- '15 AMERICAN BISCUIT Co., 815 Battery St., San Francisco, Cal.
- '15 AMERICAN CAN Co., Mills Building, San Francisco, Cal.
- '15 ARMOUR & Co., Battery and Union Sts., San Francisco, Cal.
- '15 ARMSBY, J. K., COMPANY, San Francisco, Cal.
- '15 ATLAS GAS ENGINE Co., INC., Foot of 22d Avenue, Oakland, Cal.
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- '15 BLOEDEL-DONOVAN LUMBER MILLS, Bellingham, Wash.
- '15 BOND AND GOODWIN, 454 California St., San Francisco, Cal.
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- '15 CALIFORNIA DOOR Co., 43 Main St., San Francisco, Cal.
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- '15 CALIFORNIA WIRE CLOTH COMPANY, San Francisco, Cal.
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- '15 PACIFIC HARDWARE AND STEEL Co., 7th and Townsend Sts., San Francisco, Cal.
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- '15 PHILLIPS SHEET AND TIN PLATE Co., Weirton, W. Va.
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- '15 WESTERN FUEL Co., 430 California St., San Francisco, Cal.
- '15 WESTERN MEAT Co., 6th and Townsend Sts., San Francisco, Cal.
- '15 WHITE BROS., HARDWOOD LUMBER, 5th and Brannan Sts., San Francisco, Cal.

Active Members

LIFE MEMBERS INDICATED BY ASTERISK (*).

- '16 ADAMS, PROF. CHAS. C., State College of Forestry, Syracuse, N. Y.
- '13 ADAMS, WM. C., Commissioner of Fisheries and Game, Boston, Mass.
- '10 AITCHINSON, W. W., 5 Wabash Ave., Chicago, Ill.
- '98 ALEXANDER, GEORGE L., Grayling, Mich.
- '14 ALEXANDER, M. L., President, Louisiana Conservation Commission, New Orleans, La.
- '06 ALFORD, JARE, President State Board of Fish Commission, 29 W. Dayton St., Madison, Wis.
- '08 ALLER, H. D., U. S. Bureau of Fisheries, Washington, D. C.
- '08 ANDERSON, AUGUST J., Box 109, Marquette, Mich.
- '12 ANDERSON, FRANK, 1331 East Seventh Ave., Denver, Colo.
- '92 ANDERSON, J. F., Bastad, Sweden.
- '16 ANDERSON, SAM G., Hutchinson, Minn.
- '14 ANDERSON, T. T., Liggett and Myers Tobacco Co., St. Louis Mo.
- '78 ANNIN, JAMES, Caledonia, N. Y.
- '14 ANNIN, HOWARD, Caledonia, N. Y.
- '12 ANTOINE, CHARLES, 340 So. Wabash Ave., Chicago, Ill.
- '15 ARNOLD AND WINSOR CO., 14 Boston Fish Pier, Boston, Mass.
- '16 ARTHUR, STANLEY CLISBY, New Orleans, La.
- '06 AVERY, CARLOS, Capitol Bldg., St. Paul, Minn.
- '10 ASBURY PARK FISHING CLUB, John F. Seger, 703 Cookman Ave., Asbury Park, N. J.
- '84 ATKINS, CHARLES G., U. S. Bureau of Fisheries, Bucksport, Me.
- '03 ATWOOD, ANTHONY, 73 Waterest St., Plymouth, Mass.
- '15 ATWOOD, IRVING M., 31 Boston Fish Pier, Boston, Mass.
- '10 AUGUST, W. A., 33 Fulton St., New York City.

- '01 BARCOCK, JOHN P., Provincial Fisheries' Department, Victoria, British Columbia.
- '12 BARCOCK, WILLIAM H., 520 The Rookery, Chicago, Ill.
- '16 BAILEY, S. C., Bemidji, Minn.
- '15 BAKER, BOYES AND WATSON CO., 38 Boston Fish Pier, Boston, Mass.
- '15 BALCH, HOWARD K., 158 W. Austin Ave., Chicago, Ill.
- '13 BALDWIN, MARCUS D., Montana Fish and Game Commission, Kalispell, Mont.
- '01 BALDWIN, O. N., U. S. Bureau of Fisheries, Saratoga, Wyo.
- '98 BALL, E. M., U. S. Bureau of Fisheries, Washington, D. C.
- '10 BALLARD, S. THRUSTON, Louisville, Ky.
- '16 BARBER, WM. E., Lacrosse, Wis.
- '16 BARBOUR, J. W., St. Joseph, La.
- '05 BARBOUR, THOMAS, Museum of Comparative Zoology, Cambridge, Mass.
- *'12 BARNES, EARNEST W., Supt., R. I. Fisheries Experiment Station, Wickford, R. I.
- '15 BARNES, F. C., Front St., Portland, Ore.
- '10 BARRON, JAMES T., 405 Wells Fargo Bldg., Portland, Ore.
- '16 BARROWS, MORTON, 1415 Pioneer Bldg., St. Paul, Minn.
- '86 BARTLETT, DR. S. P., U. S. Bureau of Fisheries, Quincy, Ill.
- '12 BAUER, A., 25th and Dearborn Sts., Chicago, Ill.
- '16 BAXTER, C. E., Lakefield, Minn.
- '14 BEAL, F. J., State Commissioner of Fisheries, Plymouth, N. H.
- '04 BEAN, BARTON A., U. S. National Museum, Washington, D. C.
- '16 BEATTY, JAMES, Cook, Minn.
- '01 BEEMAN, HENRY W., New Preston, Conn.

- *'13 BELDING, DAVID L., Biologist, Massachusetts Department of Fisheries and Game, Boston, Mass.
'13 BELL, J. C., Alaska Packers' Association, San Francisco, Cal.
'80 BELMONT, PERRY, 1618 New Hampshire Ave., Washington, D. C.
'16 BENNETT, C. A., Granite Falls, Minn.
*13 BENSON, JOHN T., Director, Zoological Garden, Boston, Mass.
'13 BERG, GEORGE, Indiana Fish Commission, Indianapolis, Ind.
'06 BERKHOUS, JERRY R., Pennsylvania Fish Commission, Torresdale, Pa.
'13 BICKFORD, W. M., Missoula, Mont.
'13 BICKLEY, CHAS., 55 Robbins St., Waltham, Mass.
*97 BIRGE, DR. E. A., State Board of Fish Commissioners, University of Wisconsin, Madison, Wis.
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'13 BLACKFORD, CHAS. MINOR, M.D., Staunton, Va.
'13 BLAIN, JAMES, Missouri State Fish Committee, Springfield, Mo.
'16 BLYSTAD, CHESTER N., U. S. Bureau of Fisheries, Yes Bay, Alaska.
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'00 BOWER, WARD T., U. S. Bureau of Fisheries, Washington, D. C.
'99 BOWERS, GEORGE M., Martinsburg, W. Va.
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'14 BROWN, ERNEST CLIVE, Copake, N. Y.
'96 BROWN, GEORGE M., care Pere Marquette R. R., Detroit, Mich.
'04 BROWN, G. W. N., U. S. Bureau of Fisheries, Orangeburg, S. C.
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'06 BUCK, WILLIAMS O., U. S. Bureau of Fisheries, Neosho, Mo.
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'12 BULLER, G. W., Pleasant Mount, Pa.
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'15 BURGARD, JOHN H., Lewis Bldg., Portland, Ore.
'07 BURNHAM, CHAS. W., U. S. Fisheries Station, Louisville, Ky.

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'16 CASLER, WM. A., U. S. Bureau of Fisheries, Leadville, Colo.
*03 CASSELMAN, E. S., Lake Delaware, N. Y.
'13 CASTING CLUB DE FRANCE, Place de Concorde, Paris, France.
'07 CATTE, EUGENE, Langdon, Kan.
'16 CENAC, ALBERT, Chauvin, La.
'13 CHAMBERS, F. W., Salt Lake City, Utah.
'03 CHANDLER, HORATIO, Kingston, Mass.
'06 CHEYNEY, JOHN K., Tarpon Springs, Fla.
'13 CHURCHILL, WINSTON, Cornish, N. H.

- '11 CLARK, H. WALTON, U. S. Bureau of Fisheries, Fairport, Iowa.
- *'11 CLEVELAND, W. B., Burton, Ohio.
- '12 CLIFFORD, CHARLES P., First National Bank, Chicago, Ill.
- '11 CLUB SHAWINIGAN, Club Shawinigan, St. Maurice Co., Quebec, Canada.
- '00 COBB, EREN W., Superintendent of Fisheries, Board of Game and Fish Commissioners, St. Paul, Minn.
- '04 COBB, JOHN N., Pacific Fisheries Society, c/o Alaska Packers' Association, Wells Fargo Bldg., San Francisco, Cal.
- '14 COFFMAN, J. Y., 4248 Cleveland St., St. Louis, Mo.
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- '13 SMITH, HERBERT C., White Cloud, Mich.
- '91 SMITH, DR. HUGH M., U. S. Commissioner of Fisheries, Washington, D. C.
- '99 SMITH, LEWIS H., Algona, Iowa.
- '05 SNYDER, J. P., U. S. Bureau of Fisheries, Cape Vincent, N. Y.
- '08 SPEAKS, JOHN C., Chief Warden Fish and Game Commission, Columbus, Ohio.

- '87 SPENSLEY, CALVERT, Mineral Point, Wis.
- '16 SPRAGLE, L. H., Henryville, Pa.
- '10 STACK, F. GEORGE, "Kamp Kill Kare," Raquette Lake, N. Y.
- '13 STAPLETON, J. J., Green Lake, Me.
- '04 STAPLETON, M. F., Supt., Cedar Island Lodge, Brule, Douglas Co., Wis.

- '15 STARR, C. D., Lewis Bldg., Portland, Ore.
- '00 STARR, W. J., State Board of Fish Commissioners, Eau Claire, Wis.
- '03 STEELE, G. F., Room 604, 18 E. 41st St., New York City.
- '11 STERETT, W. G., State Game, Fish and Oyster Commission, Port Lavaca, Texas.

- '03 STEVENS, ARTHUR F., 227 West Grand St., Elizabeth, N. J.
- '12 STIVERS, D. GAY, Butte Anglers' Association, Butte, Mont.
- '14 STONE, DR. WILLARD J., 3 Harold Arms, Toledo, Ohio.
- '04 STORY, JOHN A., U. S. Bureau of Fisheries, Green Lake, Me.
- '15 STRINGHAM, EMERSON, U. S. Bureau of Fisheries, Washington, D. C.

- '16 STRONNER, JESSE LEE, Orangeburg, S. C.
- '14 STRUVEN, CHAS. M., 114 S. Frederick St., Baltimore, Md.
- '16 STUCKE, EDWIN W., 3811 Brown St., Philadelphia, Pa.
- '13 SULLIVAN, WALTER E., Tufts School of Medicine, Boston, Mass.
- '04 SURBUR, THADDEUS, U. S. Bureau of Fisheries, Homer, Minn.
- '15 SUTRO, ADOLPH NEWTON, 1155 Pine St., San Francisco, Cal.
- '10 SWORD, C. B., New Westminster, British Columbia, Canada.

- '04 TALBOT, HENRY, Interstate Commerce Commission, Washington, D. C.
 '13 THAU, AUGUST B., 1421 Shelby St., Indianapolis, Ind.
 '99 THAYER, W. W., U. S. Bureau of Fisheries, Northville, Mich.
 '06 THOMAS, W. H., U. S. Bureau of Fisheries, Fairport, Iowa.
 '15 THOMAS, ADRIAN, 2012 Hanover Ave., Richmond, Va.
 '00 THOMPSON, W. P., 123 N. Fifth St., Philadelphia, Pa.
 '00 THOMPSON, W. T., U. S. Bureau of Fisheries, Bozeman, Mont.
 '08 THOMSON, G. H., Estes Park, Colo.
 '13 TICHENOR, A. K., Secretary Alaska Packers' Assn., San Francisco, Cal.
 '14 TILLMAN, ROBERT T., Beacon Paper Co., St. Louis, Mo.
 **13 TIMSON, WM., Vice-President, Alaska Packers' Assn., San Francisco, Cal.
 '93 TITCOMB, JOHN W., Conservation Commission, Albany, N. Y.
 '11 TONGUE, LEONARD M., 906 American Bldg., Baltimore, Md.
 '14 TORREY, PROF. HARRY BEAL, Reed College, Portland, Ore.
 *01 and '12 TOWNSEND, DR. CHARLES H., Director New York Aquarium, New York, N. Y.
 '13 TREXLER, COL. HARRY C., Allentown, Pa.
 '13 TRIGGS, CHAS. W., 218 N. Canal St., Chicago, Ill.
 '15 TROYER, M., Astoria Iron Works, Seattle, Wash.
 '16 TRULL, HARRY S., 317 E. 196th St., Fordham, N. Y.
 '99 TUBBS, FRANK A., U. S. Bureau of Fisheries, Mammoth Spring, Ark.
 '98 TULLIAN, EUGENE A., Box 1267, New Orleans, La.
 '13 TURNER, CHAS. C., Judge Kentucky Court of Appeals, Frankfort, Ky.
 '13 TYSON, JAS W., Connecticut Fish and Game Commission, Hartford, Conn.
 *11 VALLETTE, LUCIANO H., Chief of Section of Fish Culture, 827 Rivadavia, Buenos Aires, Argentina.
 '09 VAN ATTA, CLYDE H., U. S. Bureau of Fisheries, Yes Bay Hatchery, Ketchikan, Alaska.
 *14 VANDERGRIFT, S. H., 1728 New Hampshire Ave., Washington, D. C.
 '13 VARDEN, GEO. S., Paris, Ky.
 '10 VILES, BLAINE S., Inland Fish and Game Commissioner, Augusta, Me.
 '14 VOGEL, J. C., 2203 Pearl St., Philadelphia, Pa.
 '12 VOGT, JAMES H., Nevada Fish Commission, Carson City, Nevada.
 '09 VON LENGERKE, J., 200 Fifth Ave., New York City.
 '06 WADDELL, JOHN, Grand Rapids, Mich.
 '15 WAKEFIELD, L. H., 1310 Smith Bldg., Seattle, Wash.
 '96 WALKER, BRYANT, Detroit, Mich.
 '11 WALKER, DR. H. T., 210 Main St., Denison, Texas.
 '16 WALLACE, FREDERICK WILLIAM, 600 Read Bldg., 45 St. Alexander St., Montreal, Quebec, Canada.
 '96 WALTERS, C. H., Cold Spring Harbor, N. Y.
 '98 WARD, PROF. H. B., University of Illinois, Urbana, Ill.
 '12 WARD, J. QUINCY, Executive Agent, Kentucky Game and Fish Commission, Frankfort, Ky.
 '14 WASHBURN, PROF. F. L., 1112 Sixth St., S. E., Minneapolis, Minn.
 '13 WEBB, W. SEWARD, 44th St. and Vanderbilt Ave., New York City.
 '16 WEEKS, ANDREW GRAY, 8 Congress St., Boston, Mass.
 '13 WEIL, WALTER G., Majestic Bldg., Chicago, Ill.
 '15 WEIS, CAPT. JAS. E., St. Joseph, Mo.
 '15 WEISE, ENGLEBERG, Seattle, Wash.

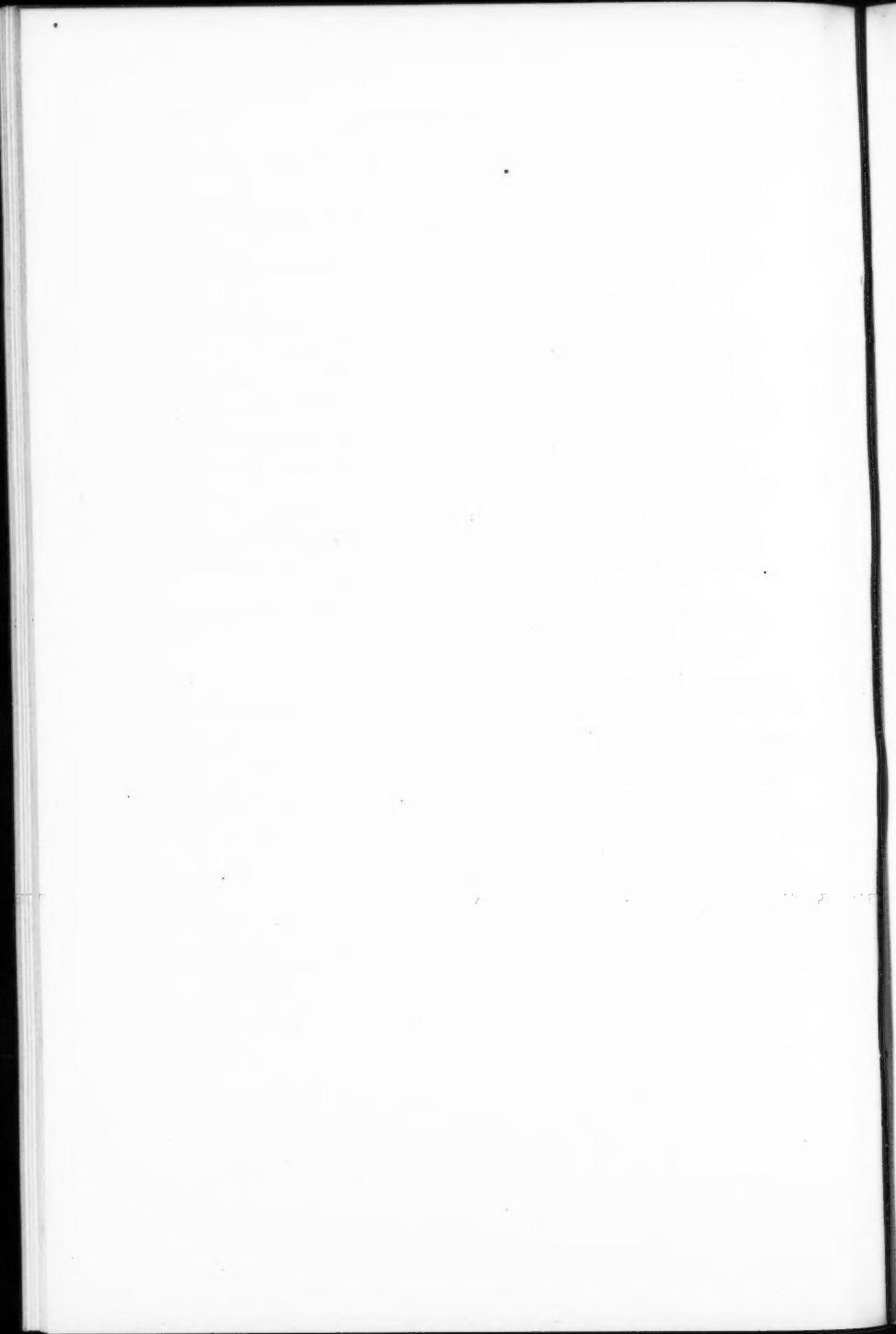
- '13 WELSH, WM. W., Scientific Assistant U. S. Bureau of Fisheries,
Washington, D. C.
'15 WELSCH, R., Bellingham, Wash.
'01 WENTWORTH, E. E., U. S. Bureau of Fisheries, Duckabush, Wash.
'13 WESTERFELD, CARL, New Call Bldg., San Francisco, Cal.
'13 WESTERMANN, J. H., Harrietta, Mich.
'01 WHEELER, CHARLES STETSON, Union Trust Building, San Francisco,
Cal.
'15 WHEELER, FRED. M., 546 Fulton St., Chicago, Ill.
'04 WHITAKER, ANDREW R., State Fishery Commission, Phoenixville, Pa.
'96 WHITE, R. TYSON, 320 Bridge Street, Brooklyn, N. Y.
'10 WHITMAN, EDWARD C., Canso, Nova Scotia, Canada.
'15 WHITESIDE, R. B., 204 Sellwood Bldg., Duluth, Minn.
'01 WILSON, C. H. Glen Falls, N. Y.
'11 WILSON, J. S. P. H., Chairman, Board of Inland Game and Fish
Commissioners, Auburn, Me.
'10 WINCHESTER, GRANT E., Forest, Fish and Game Commission, Bemus
Point, N. Y.
'00 WINN, DENNIS, U. S. Bureau of Fisheries, 1217 L. C. Smith Bldg.,
Seattle, Wash.
'13 WINTER, J. H., Alaska Packers' Assn., San Francisco, Cal.
'99 WIRES, S. P., U. S. Bureau of Fisheries, Duluth, Minn.
**'13 WISNER, J. NELSON, Director, Instituto de Pesca del Uruguay,
Punta del Este, Uruguay.
**'05 WOLTERS, CHAS. A., Oxford and Marvine Streets, Philadelphia, Pa.
'97 WOOD, C. C., Plymouth, Mass.
'13 WOODS, JOHN P., President, Missouri State Fish Commission, 1st
and Wright Sts., St. Louis, Mo.
'14 WORK, GERALD, Perkins Hill, Akron, Ohio.
'84 WORTH, S. G., 518 Colonial Ave., Norfolk, Va.

'09 YERINGTON, EDWARD B., Board of Fish Commissioners, Carson
City, Nev.
'16 YOUNGER, R. J., Houma, La.

'99 ZALSMAN, P. G., Grayling, Mich.

Recapitulation

Honorary	72
Corresponding	17
Patrons	53
Active	554
 Total	 696



CONSTITUTION

(As amended to date)

ARTICLE I

NAME AND OBJECT

The name of this Society shall be American Fisheries Society. Its object shall be to promote the cause of fish culture; to gather and diffuse information bearing upon its practical success, and upon all matters relating to the fisheries; the uniting and encouraging of all interests of fish culture and the fisheries, and the treatment of all questions regarding fish, of a scientific and economic character.

ARTICLE II

MEMBERSHIP

Active Members.—Any person may, upon a two-thirds vote and the payment of two dollars, become a member of this Society. In case members do not pay their fees, which shall be two dollars per year after first year, and are delinquent for two years, they shall be notified by the treasurer, and if the amount due is not paid within a month thereafter, they shall be, without further notice, dropped from the roll of membership.

Any library, sporting or fishing club, society, firm or corporation may upon two-thirds vote and the payment of the regular annual fee, become a member of this Society and entitled to all its publications.

Life Members.—Any person shall, upon a two-thirds vote and the payment of twenty-five dollars, become a life member of this Society, and shall thereafter be exempt from all annual dues.

Patrons.—Any person, society, club, firm or corporation, on approval by the Executive Committee and on payment of \$50.00, may become a Patron of this Society

with all the privileges of a life member, and then shall be listed as such in all published lists of the Society. The money thus received shall become part of the permanent funds of the Society and the interest alone be used as the Society shall designate.

Honorary and Corresponding Members.—Any person can be made an honorary or a corresponding member upon a two-thirds vote of the members present at any regular meeting.

The President (by name) of the United States and the Governors (by name) of the several states shall be honorary members of the Society.

Election of Members Between Annual Meetings.—The President, Recording Secretary and Treasurer of the Society are hereby authorized, during the time intervening between annual meetings, to act on all individual applications for membership in the Society, a majority vote of the Committee to elect or reject such applications as may be duly made.

ARTICLE III

SECTIONS

On presentation of a formal written petition signed by one hundred or more members, the Executive Committee of the American Fisheries Society may approve the formation in any region of a Section of the American Fisheries Society to be known as the — Section.

Such a Section may organize by electing its own officers, and by adopting such rules as are not in conflict with the Constitution and By-Laws of the American Fisheries Society.

It may hold meetings and otherwise advance the general interests of the Society, except that the time and place of its annual meeting must receive the approval of the Executive Committee of the American Fisheries Society, and that without specific vote of the American Fisheries Society, the Section shall not commit itself to any expression of public policy on fishing matters.

It may further incur indebtedness to an amount necessary for the conduct of its work not to exceed one-half of the sum received in annual dues from members of said section.

Such bills duly approved by the Chairman and Recorder of the Section shall be paid on presentation to the Treasurer of the American Fisheries Society.

ARTICLE IV

OFFICERS

The officers of this Society shall be a president and a vice-president, who shall be ineligible for election to the same office until a year after the expiration of their term; a corresponding secretary, a recording secretary, an editor, a treasurer, and an executive committee of seven, which, with the officers before named, shall form a council and transact such business as may be necessary when the Society is not in session—four to constitute a quorum.

In addition to the officers above named there shall be elected annually five vice-presidents who shall be in charge of the following five divisions or sections:

1. Fish culture.
2. Commercial fishing.
3. Aquatic biology and physics.
4. Angling.
5. Protection and legislation.

Vice-Presidents of sections are expected to present reports at each annual meeting.

ARTICLE V

MEETINGS

The regular meeting of the Society shall be held once a year, the time and place being decided upon at the pre-

vious meeting, or, in default of such action, by the executive committee.

ARTICLE VI

ORDER OF BUSINESS

1. Call to order by president.
2. Roll call of members.
3. Applications for membership.
4. Reports of officers.
 - a. President.
 - b. Secretary.
 - c. Treasurer.
 - d. Vice-Presidents of Divisions.
 - e. Standing Committees.
5. Committees appointed by the president.
 - a. Committee of five on nomination of officers for ensuing year.
 - b. Committee of three on time and place of next meeting.
 - c. Auditing committee of three.
 - d. Committee of three on programme.
 - e. Committee of three on publication.
 - f. Committee of three on publicity.
6. Reading of papers and discussion of same.
(Note—In the reading of papers preference shall be given to the members present.)
7. Miscellaneous business.
8. Adjournment.

ARTICLE VII

CHANGING THE CONSTITUTION

The constitution of the Society may be amended, altered or repealed by a two-thirds vote of the members present at any regular meeting, provided at least fifteen members are present at said regular meeting.

